What is SARE?

Since 1988, the Sustainable Agriculture Research & Education (SARE) program has been the go-to USDA grants and outreach program for farmers, ranchers, researchers and educators who want to develop innovations that improve farm profitability, protect water and land, and revitalize communities. To date, SARE has awarded over $389 million to more than 8,542 initiatives.

SARE is grassroots with far-reaching impact

Four regional councils of expert practitioners set priorities and make grants in every state and island protectorate.

SARE communicates results

SARE shares project results by requiring grantees to conduct outreach and grower engagement; and by maintaining an online library of practical publications, grantee-produced information products and other educational materials.

www.sare.org

SARE: Advancing the Frontier of Sustainable Agriculture in...

South Carolina

Project Highlight: Fruit Bagging Reduce Reliances on Pesticides

When Clemson University fruit specialist Juan Carlos Melgar suggested putting a paper bag over a peach to detract insects and diseases during production, farmers laughed. But when his SARE-funded trials showed that the technique protects the fruit from devastating brown rot, marauding insects like plum curculio and even hungry birds, producers and backyard growers started paying attention.

Researchers found that bagging peaches between petal fall and harvest reduces pesticide use while increasing yields and maintaining flavor. Even though it involves more labor, Melgar estimated that bagging can increase revenue by $95 per tree in an organic system when the fruit is sold directly to consumers. “We’ve gotten a lot of positive responses from farmers all over the country as a result of the research study,” said Melgar.

Fruit bagging for protection is a common strategy in Asia. With South Carolina ranked second in the nation behind California in peach production at 77,000 tons, researchers at Clemson felt that applying the technique to orchards was a worthwhile endeavor because peach growers in the southeastern U.S. face very high pest and disease pressures. Melgar is taking this research to a regional level with a newly acquired $1 million USDA-NIFA grant, applying the technique to more orchards in South Carolina, Georgia and Florida.

For more information on this project, see sare.org/projects, and search for project number OS16-094.

SARE in South Carolina

southern.sare.org/sare-in-your-state/south-carolina

$5,120,426 in total funding
82 grant projects
(since 1988)

For a complete list of grant projects state by state, go to www.sare.org/state-summaries
SARE Grants in South Carolina

Total awards: 82 grants
- 19 Research and Education
- 6 Sustainable Community Innovation
- 13 Professional Development Program
- 21 Farmer/Rancher
- 10 Graduate Student
- 10 On Farm Research/Partnership
- 3 Education Only

Total funding: $5,120,426
- $3,670,122 Research and Education
- $43,620 Sustainable Community Innovation
- $799,675 Professional Development Program
- $197,885 Farmer/Rancher
- $131,247 Graduate Student
- $142,377 On Farm Research/Partnership
- $135,500 Education Only

Find a complete list of projects on page 3.

SARE's Impact

53 percent of producers report using a new production technique after reading a SARE publication.

79 percent of producers said they improved soil quality through their SARE project.

64 percent of producers said their SARE project helped them achieve higher sales.

Learn about local impacts at: southern.sare.org/sare-in-your-state/south-carolina

Contact Your SARE State Coordinator

SARE sustainable ag coordinators run state-level educational programs for Extension and other ag professionals, and many help grant applicants and recipients with planning and outreach. Visit southern.sare.org/state-pages/south-carolina to learn more.

John Andrae
Clemson University
(864) 656-4080
jandrae@clemson.edu

Joshua Idassi
South Carolina State University
(803) 878-9038
jidassi@scsu.edu

For detailed information on SARE projects, go to www.SARE.org

SARE is funded by the USDA’s National Institute of Food and Agriculture (NIFA).

This report includes summaries of competitive grant programs only. Some competitive grant programs that are no longer offered may be included or excluded from the totals in this report depending on the grant program and SARE region.
South Carolina has been awarded $5,120,426 grants to support 78 projects, including but not limited to, 15 research and/or education projects, 13 professional development projects and 21 producer-led projects. South Carolina has also received additional SARE support through multi-state projects.

## RESEARCH AND EDUCATION GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| LS23-379  | Flipping the cages on sustainable aquaculture: a study on oyster aquaculture technique and policy to reduce pathogens | $358,557     | Sarah Pedigo  
   South Carolina Sea Grant Consortium  
   Matthew Gorstein  
   South Carolina Sea Grant Consortium  
   Dr. Peter Kingsley-Smith  
   South Carolina Department of Natural Resources Marine Resources  
   Mike Marshall  
   South Carolina Department of Health and Environmental Control  
   Dr. Matthew Nowlin  
   College of Charleston |
| LS22-374  | Cover crop inter-seeding in organic corn production to reduce resource inputs and soil disturbance and enhance pest control and farm profitability | $371,000     | Dr. Sruthi Narayanan  
   Clemson University  
   Dr. Carmen Blubaugh  
   University of Illinois  
   Dr. Joshua Idassi  
   South Carolina State University  
   Dr. Dave Lamie  
   Clemson University  
   Dr. Meghnaa Tallapragada  
   Temple University  
   Dr. Rongzhong Ye  
   Clemson University |
| LS22-369  | Establishing an Organic Watermelon Industry in South Carolina                 | $369,999     | Matthew Cutulle  
   Clemson University, CREC  
   Dr. Bhupinder Farmaha  
   Clemson University  
   Dr. Shaker Kousik  
   USDA-ARS- United States Vegetable Lab  
   Dr. Amnon Levi  
   USDA-ARS-United States Vegetable Lab  
   Brian Ward |
| LS22-366  | Development of Sustainable Strategies for Managing Bacterial Diseases and Improving Tree Health in the Peach Production System | $371,000     | Hehe Wang  
   Clemson University  
   Juan Carlos Melgar  
   Clemson University  
   Guido Schnabel  
   Clemson University  
   Dr. Michael Vassalos  
   Clemson University  
   Dr. Rongzhong Ye  
   Clemson University |
| LS21-355  | Gullah/Geechee Agro-Culture: Sustaining Culture to Sustain Agriculture in the Lowcountry | $341,346     | Dr. Najmah Thomas  
   University of South Carolina Beaufort |
<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| LS21-359 | Strengthening Farmer-consumer Connections for Sustainable Agricultural Systems | $213,954     | Courtney Quinn  
Furman University  
Dr. Karen Allen  
Furman University  
Dr. John Quinn  
Furman University |
| LS19-306 | Utility of Anaerobic Soil Disinfection and Organic Herbicides for Weed and Disease Management in Organic Solanaceous Vegetable Systems | $293,470     | Matthew Cutulle  
Clemson University, CREC |
| LS19-305 | Incorporating Natural, Non-toxic Arthropod Resistant Tomato Varieties into Southern Production Systems | $299,963     | Juang-Horng Chong  
Clemson University |
| LS16-273 | Improving Silvopasture Systems in the South: Identification of Suitable Forage Crops and Enhancement of Environmental Quality in Upland Forests | $135,487     | Dr. John Quinn  
Furman University |
| LS09-217 | Improvement of the safety of food handling practices on small farms         | $200,000     | Dr. Paul Dawson  
Clemson University |
| LS06-188 | Expanding the grazing season for sustainable year-round forage-finished beef production | $163,000     | Susan Duckett  
Clemson University |
| LS04-213 | Development and Integration of Sustainable Agriculture Core Curriculum Training into the Southern Region Extension Education System | $241,000     | Dr. Geoff Zehnder  
Clemson University |
| LS03-157 | Suppression of weeds and other pests in fresh market vegetables using wild radish cover crop | $173,125     | Jason Norsworthy  
Clemson University |
| LS03-155 | Creating a value chain system for local and regional farm products       | $19,310      | Dr. Geoff Zehnder  
Clemson University |
| LS93-054 | Evaluation of Low-Input, No-Till, No-Herbicide Continuous Grazing System for Dairy Cows | $118,911     | Jean Bertrand  
Clemson University |

PROFESSIONAL DEVELOPMENT PROGRAM GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| SPDP23-021   | Indigo and Companion Food Crops: Opportunities for Limited Resource Farmers in the Lowcountry of South Carolina and Georgia | $79,500      | Donna Hardy  
ICIC |
| SPDP22-15    | Training Educators in the Southern Region Using Aquaponics as a Sustainable Agriculture Solution | $71,322      | Dr. Lance Beecher  
Clemson University  
Ben Calhoun  
Greenwood Area SBDC  
Roland McReynolds  
Carolina Farm Stewardship Association |
<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| SPDP21-01 | Train the Trainers: Reducing impacts from harmful algal blooms in livestock water sources in South Carolina | $79,975      | Dr. Debabrata Sahoo  
Clemson University  
Dr. Matthew Burns  
Clemson University  
Mark Nettles  
South Carolina State University, 1890 Research and Extension  
Heather Nix  
Clemson University Cooperative Extension  
Dr. Michael Vassalos  
Clemson University  
Sarah White  
Clemson University |
| ES19-150  | Advanced Soil Health Training for South Carolina Agriculture Professionals    | $79,847      | Kelly Flynn  
Clemson University |
| ES17-137  | Wholesale Success: Building the capacity of farmers to meet demand for locally and sustainably grown produce | $78,008      | Dr. Geoff Zehnder  
Clemson University |
| ES13-117  | Training in Renewable Energy Systems for Small Farms to Reduce Energy Costs and Improve Profitability | $78,128      | Dr. Geoff Zehnder  
Clemson University |
| ES11-108  | Pollinator Conservation Short Course                                         | $92,066      | Eric Mader  
The Xerces Society |
| ES10-106  | On-Farm Training in Organic Pest Management Practices for Small, Diversified Farms | $83,775      | Dr. Geoff Zehnder  
Clemson University |
| ES02-064  | Calhoun Fields Laboratory: A Program for Experiential Training in Organic Farming Systems | $49,926      | Dr. Geoff Zehnder  
Clemson University |
| ES01-057  | South Carolina Farm and Forest Land Conservation Training                    | $25,428      | Ben Boozer  
The Clemson Institute for Economic & Community Develop |
| ES97-017  | Overcoming Training Obstacles: A Realistic Cost-Effective Approach           | $10,000      | Charles Q. Artis  
South Carolina State University, Community and Economic Development |
| ES97-018  | The First Requirement of Agriculture Sustainability: Efficient Management of Available Resources | $60,000      | Charles Q. Artis  
South Carolina State University, Community and Economic Development |
| LST94-006 | Extending Sustainable Agriculture Concepts and Practices to Traditional Agricultural Advisors | $11,700      | Jim Palmer  
Clemson |

**FARMER/RANCHER GRANTS**

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
</table>
| FS23-350  | The Effectiveness in Attracting Oyster Spat on PVC versus Bamboo Stakes for Reef Restoration in the North Edisto River | $15,000      | Alison Pierce  
Barrier Island Oyster Co. |
| FS22-341  | Does reduction of nitrate inputs in pasture land treated with Chlorella vulgaris result in cost savings and healthier soil and grass? | $10,975      | Dale Snyder  
Sweetgrass Garden Co-op |
| FS21-330  | Does Treatment with Chlorella vulgaris Extend the Life of Tomato Plants to Increase Tomato Sales? | $14,640      | Dale Snyder  
Sweetgrass Garden Co-op |
<table>
<thead>
<tr>
<th>Project Code</th>
<th>Project Title</th>
<th>Funding</th>
<th>PI Name</th>
<th>PI Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS20-326</td>
<td>Summer Cover Crops for Organic No-till Broccoli</td>
<td>$14,820</td>
<td>Sarah Belk</td>
<td>Wild Hope Farm</td>
</tr>
<tr>
<td>FS18-309</td>
<td>Studying the Use of Copper to Raise Healthier Goats</td>
<td>$10,000</td>
<td>Judy Langley</td>
<td>Judy Langley</td>
</tr>
<tr>
<td>FS17-300</td>
<td>Scaling Indigo Production in South Carolina</td>
<td>$5,965</td>
<td>Kathy McCullough</td>
<td>Farmer</td>
</tr>
<tr>
<td>FS16-288</td>
<td>Modified Method for Roller-Crimper No Till System in the Southeast Coastal Plain</td>
<td>$8,327</td>
<td>Mary Connor</td>
<td>Three Sisters Farm</td>
</tr>
<tr>
<td>FS14-284</td>
<td>Is freshwater fish compost as effective as saltwater fish compost on vegetable production?</td>
<td>$10,000</td>
<td>Dale Snyder</td>
<td>Sweetgrass Garden Co-op</td>
</tr>
<tr>
<td>FS13-276</td>
<td>Shade cloth for fall bearing blackberry druplet abortion/malfunction problems in southeastern USA</td>
<td>$6,458</td>
<td>Walker Miller</td>
<td>The Happy Berry Bunch</td>
</tr>
<tr>
<td>FS11-257</td>
<td>Is Fish Waste Compost worth the Mess and Effort?</td>
<td>$9,848</td>
<td>Dale Snyder</td>
<td>Sweetgrass Garden Co-op</td>
</tr>
<tr>
<td>FS11-255</td>
<td>Cucumber Pollination with Bumblebees</td>
<td>$8,530</td>
<td>David MacFawn</td>
<td>Rawl Farms</td>
</tr>
<tr>
<td>FS10-247</td>
<td>Using Buckwheat to Attract Beneficial Insects for Crop Protection</td>
<td>$9,037</td>
<td>Daniel Parson</td>
<td>Parson Produce</td>
</tr>
<tr>
<td>FS10-245</td>
<td>Forage Chicory Use in Rotational Grazing of Sheep to Reduce Intestinal Worms, Reduce Grain Supplementation, And Maximize Growth</td>
<td>$9,078</td>
<td>Kathy McCaskill</td>
<td>Old McCaskill's Farm</td>
</tr>
<tr>
<td>FS09-233</td>
<td>Dual Season Organic Asparagus Production</td>
<td>$9,995</td>
<td>Mary Connor</td>
<td>Three Sisters Farm</td>
</tr>
<tr>
<td>FS04-184</td>
<td>Edamame Variety Trials for the Local Fresh Market</td>
<td>$4,777</td>
<td>Carolyn A. Prince</td>
<td></td>
</tr>
<tr>
<td>FS99-102</td>
<td>Cattle Lane Construction Alternatives That Enhance Intensive Grazing Systems</td>
<td>$9,850</td>
<td>Tom Trantham</td>
<td>Trantham's Dairy Farm</td>
</tr>
<tr>
<td>FS98-070</td>
<td>Red Plastic Mulch as an Alternative to Insecticides in Production of Seedless Watermelons</td>
<td>$7,390</td>
<td>John Frazier</td>
<td></td>
</tr>
<tr>
<td>FS98-079</td>
<td>Demonstration of a Low-Input Diversified Small Farm Operation</td>
<td>$9,200</td>
<td>Theodore Nesmith</td>
<td></td>
</tr>
<tr>
<td>FS95-033</td>
<td>Cover Crops in Integrated Vegetable Production Systems</td>
<td>$9,285</td>
<td>Charles Wingard</td>
<td>W.P. Rawl &amp; Sons Farms</td>
</tr>
<tr>
<td>FS94-005</td>
<td>Vegetable Marketing Strategies for a Small Farm Co-op</td>
<td>$10,000</td>
<td>Curtis Inabinett</td>
<td>Sea Island Farmers Co-op</td>
</tr>
<tr>
<td>FS94-016</td>
<td>Clover Cover Crops, Weed Management and Consumer Tolerance to Insect Damage</td>
<td>$4,710</td>
<td>Horace &amp; Shaw Skipper</td>
<td>The Berry Patch</td>
</tr>
</tbody>
</table>
## GRADUATE STUDENT GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS23-283</td>
<td>Potential of Cover Crop Influence on Water Repellency and the Sustainability of Southern U.S. Soils</td>
<td>$12,042</td>
<td>Dr. Dara Park, Clemson University, Payton Davis, Clemson University</td>
</tr>
<tr>
<td>GS23-274</td>
<td>Enhancing the Biological Control of the Diamondback Moth (Plutella xylostella) Through Habitat Management for Sustainable Brassica Production</td>
<td>$12,341</td>
<td>Dr. Tom Bilbo, Clemson University, Amna Ghani, Clemson University</td>
</tr>
<tr>
<td>GS22-259</td>
<td>PRECISION: leveraging deeP REinforCement learning algorithm for Sustainable IrrigatiON scheduling</td>
<td>$16,500</td>
<td>Dr. Vidya Samadi, Clemson University, Lisa Umutoni, Clemson University</td>
</tr>
<tr>
<td>GS22-263</td>
<td>Development and Phenotypic Evaluation of a Brassica oleracea Leafy Greens Diversity Panel</td>
<td>$16,500</td>
<td>Dr. Sandra Branham, Clemson University, Khushwinder Kaur, Clemson University</td>
</tr>
<tr>
<td>GS18-192</td>
<td>Cover Cropping to Improve Soil Moisture Content for the Following Cash Crop</td>
<td>$16,496</td>
<td>Dr. Sruthi Narayanan, Clemson University, Ricardo St. Aime, Clemson University</td>
</tr>
<tr>
<td>GS17-174</td>
<td>Optimizing Nutritional Management in Fruit Tree Production in Southern U.S.</td>
<td>$16,441</td>
<td>Juan Carlos Melgar, Clemson University, Qi Zhou, Clemson University</td>
</tr>
<tr>
<td>GS13-126</td>
<td>Weeds, Nitrogen, and Yield: Measuring the Effectiveness of an Organic No-Till System</td>
<td>$10,927</td>
<td>Dr. Geoff Zehnder, Clemson University, David Robb, Clemson University</td>
</tr>
<tr>
<td>GS04-034</td>
<td>Control of Soilborne Fungi with Biofumigation</td>
<td>$10,000</td>
<td>Anthony Keinath, Clemson University, Samuel Njoroge, Clemson University</td>
</tr>
<tr>
<td>GS04-041</td>
<td>Preliminary Investigation for Application of Supercritical Fluid Extraction Technology for Garlic Oil Extraction</td>
<td>$10,000</td>
<td>Dr. Terry Walker, Clemson University, Meidui Dong, Clemson University</td>
</tr>
<tr>
<td>GS03-020</td>
<td>The Assessment of Conservation and Traditional Tillage Systems on Weed Dynamics, Insect Abundance, and Northern Bobwhite Quail Life and Behavioral Patterns</td>
<td>$10,000</td>
<td>William Bowerman, Clemson University, Derek Eggert, Clemson University</td>
</tr>
</tbody>
</table>

## ON FARM RESEARCH/PARTNERSHIP GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>OS20-133</td>
<td>The Potential of Inter-seeded Cover Crops for Enhancing Soil Health and Soil Moisture Content in a Row Crop Production System</td>
<td>$20,000</td>
<td>Dr. Sruthi Narayanan, Clemson University</td>
</tr>
<tr>
<td>OS18-118</td>
<td>Cover Cropping to Increase the Sustainability of Cropping Systems by Developing Soil Organic Matter, Improving Soil Health, and Suppressing Weed Growth</td>
<td>$15,000</td>
<td>Dr. Sruthi Narayanan, Clemson University</td>
</tr>
<tr>
<td>OS17-109</td>
<td>Identification of Factors Involved in Peach Skin Streaking</td>
<td>$15,000</td>
<td>Guido Schnabel, Clemson University</td>
</tr>
</tbody>
</table>

Clemson University
OS16-093  Increasing Sustainability of Peanut, Cotton, and Soybean Production Systems Through Innovative Interseeding Technology to Enhance Farm Profit and Reduce Pest Occurrence  $14,990  Daniel Anco  Clemson University

OS16-100  Getting to the Bottom of ‘Bronzing’, A Peach Skin Disorder Causing Severe Losses for Organic and Conventional Peach Growers  $15,000  Guido Schnabel  Clemson University

OS16-096  Cover Crop Influence on Stored Soil Water Availability to Subsequent Crops  $14,995  Dr.Sruthi Narayanan  Clemson University

OS16-094  Fruit Bagging as a Strategy to Reduce Reliance on Pesticides for the Production of Peaches in the Southeast  $14,967  Juan Carlos Melgar  Clemson University

OS07-035  On-Farm Use of a Hybrid Vetch Cover Crop to Reduce Fusarium Wilt in Seedless Watermelon  $9,900  Anthony Keinath  Clemson University

OS03-010  Poultry Litter Research Project  $12,600  David Gunter  Clemson Extension Service

OS03-013  Growing Organic Fruits and Vegetables for Local Farmer’s Markets  $9,925  York Glover

SUSTAINABLE COMMUNITY INNOVATION GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS12-087</td>
<td>Fighting Obesity in Schools By Changing Eating Habits of Students</td>
<td>$10,000</td>
<td>Robert Behr  Ashley Ridge High School</td>
</tr>
<tr>
<td>CS10-078</td>
<td>GrowFood Carolina</td>
<td>$10,000</td>
<td>Lisa Turansky  South Carolina Coastal Conservation League</td>
</tr>
<tr>
<td>CS08-064</td>
<td>Growing the Manning Farmer’s Market</td>
<td>$5,050</td>
<td>Rebecca Rhodes  City of Manning</td>
</tr>
<tr>
<td>CS08-065</td>
<td>Marshview Community Organic Farms – Young Farmers of the Lowcountry</td>
<td>$9,700</td>
<td>Sara Reynolds  Marshview Comunity Organic Farm</td>
</tr>
<tr>
<td>CS07-058</td>
<td>Farmers Market Support Activities</td>
<td>$2,570</td>
<td>Grady Sampson</td>
</tr>
<tr>
<td>CS07-059</td>
<td>Chicora Farmers Market</td>
<td>$6,300</td>
<td>Amanda Crump  Metanoia CDC</td>
</tr>
</tbody>
</table>

EDUCATION ONLY GRANTS

<table>
<thead>
<tr>
<th>Project #</th>
<th>Project Title</th>
<th>SARE Support</th>
<th>Project Leaders</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDS23-054</td>
<td>Gullah/Geechee Heir Property Initiative: Sustaining Heir Property in the Lowcountry Through Sustainable Agriculture</td>
<td>$40,000</td>
<td>Willie Turnal  Gullah Geechee Initiative Foundation</td>
</tr>
<tr>
<td>EDS23-047</td>
<td>Young Tree Farmers Camp</td>
<td>$46,000</td>
<td>Dr Jennie Stephens  Center for Heirs’ Property Preservation  Steve Patterson  Center for Heirs’ Property Preservation</td>
</tr>
</tbody>
</table>
Total funding from the USDA SARE program to South Carolina
$5,120,426

For further information on projects, contact 770-412-4787 or ssare@uga.edu. Sustainable Agriculture Research and Education (SARE) is funded by USDA’s National Institute of Food and Agriculture (NIFA).